



Developing an approach for comparing students' multimodal text creations: A case study

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Classroom teachers routinely make judgments on the quality of their students' work based on their recognition of how effectively the student has assembled key features of the genre or the medium. Yet how readily can teachers talk about the features of student-created multimodal texts in ways that can improve learning and performance? This article aims to address this issue by describing an approach developed by the authors for analysing and comparing the salient features of two multimodal texts created by the same secondary school student, one while in Year 8 (thirteen years) and one in Year 10 (fifteen years). Firstly, the criteria of design, content and cohesion are introduced as framing for the analysis. Next, these criteria are applied to the title slide, the slide headings and the knowledge representation in each multimodal text. The choice of the criteria and the product elements to which they are applied are central to our approach which aims to be practical and to provide sufficient coverage of key elements for descriptive and comparative purposes, especially the key multimodal features of the products. This approach has potential for wider application when two multimodal products are to be described and compared.

Introduction

There has been relatively little research on how young people acquire and develop (or fail to acquire and develop) the literacies of new technologies, both in school and beyond (Selfe & Hawisher, 2004). Large scale research into young people's self reporting of technology usage affords insights into their online activity preferences, but rarely demonstrated abilities. Differentiation has often been made between gender, socio-economic areas, school and home settings, and even countries. Ainley and Enger (2007), for example, reported that Australian fifteen year olds were more proficient with technology at an operational level than their European peers; however, substantive research into possible links between technology proficiency and academic success was minimal. Educational imperatives across the world call for increased use of technologies into classroom activities in the belief that students' skills levels and learning will be enhanced, yet specific directions for improving the relationship between learning and new technologies are less evident. Such directions can be developed through research that focuses on young people's demonstrated performances with new technologies and better understanding of what is involved in learning and producing multimodal texts, as discussed next.

Researchers with the *National Assessment Program – ICT literacy Years 6 and 10 Report, 2005* (MCEETYA, 2007) developed a comprehensive ICT literacy scale against which the technological performances of students could be assessed. Considerable differences were found between the two cohorts (also in terms of gender, socio-economic areas

and state boundaries). Forty-nine per cent of Year 6 and sixty-one per cent of the Year 10 student participants *were* able to reach a proficient, basic standard for their year level in searching and selecting information sources from the Internet for specific purposes, and communicating that information for particular audiences with software applications. But 51 per cent of Year 6 and 39 per cent of Year 10 students did not. Also of concern was the finding that there was “much less frequent use of applications that involve creating, analysing or transforming information” (p. 91). Where young people have been encouraged to transform their understanding of particular topics by designing a multimodal text, positive and enhanced outcomes have been reported (Lehrer, Erickson & Connell, 1994; Kimber, Pillay & Richards, 2007; The New London Group, 1996). Such studies support the notion that digital transformations and designing can enhance the learning process. This recognition of the importance of developing young people’s creative and critical productions with technology signals the need for closer attention by researchers and educators to the actual products that young people create in their learning activities. As Adlington and Hansford (2008) contend:

students often appear to be highly proficient with digital technologies, seemingly able to juggle multiple tasks at the one time ... however, there are aspects of multimodal designs that need more careful scrutiny and explicit teaching is needed of the more subtle design elements. This is an area that teachers and researchers need to explore. (p. 8)

Data on the multimodal products of students at particular year levels is limited, especially where higher degrees of specificity like design choices are concerned. Jewitt (2005) provided an insightful example with Year 7 students in an English class using video and observation data of a lesson where students using *Word* and a digital camera were required to make a brochure about their secondary school for prospective students. Her discussion focused on the students’ design of writing and image. Of special relevance here are the design choices made at this year level. An extended quotation from Jewitt (2005) is helpful in its detail, and is highly relevant for the present study:

The technology provided students with access to a range of images, including clip art, borders, word art, imported logos, digital photos, and downloaded images, as well as their own drawings made using *Word Draw* tools. Each of the spreads in the finished brochure is produced in a different font, from plain Courier to “ornate” Apple Chancery. Some students capitalized their written texts, others used bold or italic. Other students chose to use *Word Art*, complete with shadow and three-dimensional effects. The students appeared to use font as a resource with which to visually mark their individuality within the collective process of making the brochure, rather than the conventional use of font to mark coherence and a sense of audience, in which the individual is masked within the uniform character of the collective. (pp. 324-325)

Jewitt also explained how the students utilised and worked around and within the affordances offered by such tools as the word processor to design, edit and redesign their brochure. This work required an extended sequence of decision-making in relation to the micro-task at hand, moment by moment, which may at one point be content related (the wording of a title to a slide) and at another design or presentation related (the choice of a font style). Considerable time was spent on the layout of their pages, and clearly students believed this facet of the design to be important.

More recently, Jewitt has enlarged and extended the notion of design and multimodality. She suggested that design is useful when analysing how materials are

chosen and combined to make and “distribute meanings across the boundaries of modes and multimodal connections” (Jewitt, 2008, p. 252). Her perspective is helpful when considering design as a process: thus she refers to the “dynamic character of meaning making toward an idea of change and design” (Jewitt, 2006, in Jewitt, 2008, p. 259). From a multimodal perspective, she sees the “design of image and writing” as contributing in different ways to the meaning of a text. She continues:

When writing is separated out and foregrounded to dominate the screen, it can be seen as a kind of “resistance” to the multimodal potential of new technologies and screen. In other words, a large amount of writing on screen is becoming a sign of convention or tradition. Writing on screen functions to reference the values of specialist knowledge, authority, and authenticity associated with print ... It takes a considerable amount of work to maintain writing as the dominant mode on screen. This serves to assert the connection between the old and the new. (p. 323)

We have found this perspective helpful in this paper, specifically with regard to the degree of interdependency of image and accompanying text (see also Martinec & Salway, 2005, p. 343), and more broadly with regard to the changes that occur in multimodal productions as children move through their schooling. The multi-semiotic (Kress & van Leeuwen, 2006; Martinec & Salway, 2005) and systemic functional semiotic (Unsworth, 2006) approaches to understanding the relationships between text, image and audience are tied to developing a metalanguage for describing multimodal meaning-making. For the purposes of the comparative analysis across two (or more texts) that we required, we opted for an approach that focused on discrete elements and their interplay for making meaning in a multimodal text.

With these factors in mind, our approach here is predicated on the understanding that in writing and creating, in composing and shaping, learners can strive to express the meaningful connections that they have made in elegant, digital texts — and that educators can address key components of those texts as targets for evaluative consideration and foci for their teaching. A multimodal text is a complex and multifaceted artefact, however, making such texts problematic in terms of description, evaluation and assessment. The approach described here offers a way forward by locating a rationale for description and comparison that limits its field of view to a manageable number of key aspects or elements of the multimodal text, which in turn leads to a framework with the potential for practical application. Specifically, this article focuses on two digital creations generated by one secondary school student, Jenny (fictional name), when in Years 8 and 10. This case study illustrates the approach and a way of identifying salient features of multimodal products at these year levels, for the purposes of description and comparison.

The study

Overview

The case study described in this article is drawn from a larger, longitudinal Australian Research Council funded study conducted by Griffith University from 2003 to 2008. This study, *Using and creating knowledge in the high school years: Performance, production, process and value adding in electronic curricular literacy*, examined the processes undertaken by secondary students in online learning environments and the multimodal products that they generated. The goal was to track the development of the participants’ multimodal literacies over a two-year period. In all, 16 secondary schools participated in this study and we were able to track 138 students from Years 8

and 10 (2004) to Years 10 and 12 (2006). The complete data set consists of survey data, product data, process data and screen capture data. This paper focuses on a comparative examination of a sample of the students' product data across the years in question.

Details of the research project can be viewed on the website for the Faculty of Education, Griffith University, Australia: <http://www.griffith.edu.au/education/creating-knowledge/>

Identifying the subject of the case study

Of the students whom we were able to follow from Year 8 to Year 10, we initially chose to focus on a small group as represented by one independent school for girls that had the highest number of students common to both data collection years. By initially focusing on one school, we were better able to isolate differences between the years while keeping differences between schools extant to this equation. We reviewed all students' products from the years in question to identify general characteristics and trends among the multimodal features. From that analysis, we selected ten students who best represented the cohorts. From those ten students, we selected Jenny's (fictional name) *PowerPoints* (Microsoft, 2003) as the most typical exemplars for both year levels.

The tasks (2004 and 2006)

Online tasks were developed in collaboration with a teacher advisory group. Both the 2004 and 2006 tasks were devised as cross-curricular, inquiry based activities. The 2004 task required students to evaluate possible solutions in response to the environmental threats posed by plastic bags. The 2006 task required students to investigate alternate viewpoints on an issue, like biometrics or global warming, or the school's own curricular choice.

The 2004 task was divided into three phases of development: *researching*, *designing* and *reflecting*. Part of the research process required the student to complete two templates: a *concept map* to organise information acquired from given web sources; and a *decision-making matrix* to facilitate transformation of the ideas in their concept map into a preferred solution, as required for their multimodal text creation. The most popular choice was a *PowerPoint* presentation.

The 2006 task was devised with less structural support in anticipation of students' development and increased exposure to online materials and proficiency with technological tools in the intervening two years. It was divided into three phases of development: *researching*, *evaluating* and *designing*.

Three hours were requested for completion of the 2004 task, and two hours for the 2006, either in one session or successive lessons.

Dimensions of product analysis

There are many potential dimensions to an analysis of a multimodal text and it is not immediately clear what facets should take priority or reflect a learner's capability. This problem was addressed in and reported in a study by Wyatt-Smith and Kimber (2005).

Through a process of consultation with a teacher advisory group and careful identification and selection of elements, the research group were able to define a limited number of key features required for talking about and determining quality in multimodal texts. This analysis was based initially on four aspects: *e-proficiency*, *cohesion*, *content* and *design*. This approach allowed us to identify individual differences and develop understandings of the nature of digital, multimodal text production, at and across these different year levels. For the purposes of this study, we have focused on *design*, *content* and *cohesion* for our analysis and extended description of the distinctive features of the multimodal texts, as outlined in the following discussion.

Good *design* requires a student author to have an understanding of the technologies and tools available, and an ability to manage the design environment to meet the desired goals. Essentially, design involves an intentional combination and display of forms, shapes or materials in a variety of media. For the purposes of this case study, we were interested in design at both the macro and micro levels in each product, and the student's developing ability to manage and work within this environment as demonstrated by her creations. The macro viewpoint required some kind of overview perspective on design solutions and design quality, while the micro viewpoint required attention to the detailed decision-making of the student author.

Content infers the quality of information contained within a text — its relevance, potency, accuracy and organisation. Critical factors here lie first in the student's capacity to locate and select pertinent sources. In multimodal texts, attention to the linguistic mode alone is to discount the important contribution of images and other visual elements like font style and colour. Nevertheless, learners are expected to demonstrate how successfully they have worked with existing knowledge to create new knowledge while continuing to engage their audience. In contributing to a user's success, higher order thinking processes like categorising, synthesising and accommodating different viewpoints are more desirable than copy/paste functions.

Cohesion refers to the way in which the various elements of the text are drawn together to achieve unity. For example, cohesion in terms of cognitive structuring might include the choice of wording in headings, sub-headings or cohesive ties throughout the text. Cohesion can also include the visual components of colour, colour schemes, design template or choice, and consistency in the positioning of graphics. Even the navigational system of linking can create a form of cohesion in a fundamentally non-linear structure like a web screen or linked *PowerPoint*. The degree of success or effectiveness in achieving cohesion is linked to the user's cognitive ability, technological facility and aesthetic sense.

Focusing upon the three criteria of design, content and cohesion across a multimodal text is still rather broad and open ended. Therefore, in order to achieve a more limited field of view and our objective of developing a more practical approach, we devised a strategy that focused on just three dimensions of each multimodal product that were powerful enough to characterise the student's production. The dimensions we chose were as follows:

- the first slide in the *PowerPoint* set (*title slide*);
- the choice and shape or wording in the headings of individual slides throughout the set (*headings*); and
- the quality of knowledge revealed in each slide and the complete slide set (*knowledge representation*).

Though limited, we believe these three elements are sufficient to allow analysis within and across numbers of texts, and to allow description and comparative discussion of multimodal text productions. The following sections explain the decisions we made in this respect, the particular features we chose in order to describe and make our comparisons between the different year level products.

Operational approach

Focusing on the *title slide*

In our data set of student-created products, the number of slides ranged from four to six, in varying states of completion. Given this variation, it was logical to choose, for comparative purposes, one of the early slides. We could, for example, have chosen the second slide which for many students provided a list of contents outlining their organisation of ideas and information; however, only a minority of students actually did this. These factors led us to concentrate on the title slide that each student produced. Focusing on the title slide had a number of advantages.

From the point of view of design, the title slide provided a neat representation in one slide of the level of the student's demonstrated capacity to work across the tools and resources available, to integrate the multimodal elements of a *PowerPoint* production, for example. Secondly, in many cases, it is on the title slide that some students used a *dynamic build*, that is, they incrementally build it up, by adding elements, either a new piece of text or a new image, sometimes with sound (see Figure 1). This proved a helpful indicator of the student's fluency with the medium, the student's awareness of audience and the student's point of view on the topic. Thirdly, the colour choices, background and "look" of the title slide typically signals the colour scheme for the presentation as a whole.

In terms of content, linguistic and visual choices reflect the student's cognitive framing of the information that has been researched. Often these choices also work to position the reader/audience towards the author's stance on the topic. In addition, the first slide indicates the potential cohesiveness of the product in terms of the student's capacity to choose and assemble the various elements that comprise the slide. As the title slide embodies so many of the elements of interest in multimodal text production, it provides a rich basis for comparison.

Focusing on *headings* throughout the slide set

Close consideration of the visual appearance of headings offers a way of thinking about design and the cohesiveness of the complete slide presentation. In creating the heading, the student makes choices about its size, style, position and impact. Students usually choose words, but occasionally a striking graphic to convey not just the topic, but also their attitude to the topic. In many instances, students prefer the artistry afforded by *WordArt*, experimenting with shape, textures and colours. Even managing the basic distinction between lower and upper case is indicative of a student's attention to a consistent design scheme. Many students selected a different font style, shape and colour for every slide in their set, possibly from curiosity, or perhaps as an expression of their individuality (see Jewitt, 2005).

An examination of the titles/headings of individual slides also indicates the way that the student has thought about and conceptualised the content. For example, many students chose to consider oppositional views on the topic like 'Environment vs Plastic Bags', or 'Fact vs Fiction' (for Global Warming). For many students, the adoption of an interrogatory approach defined their headings. For example, 'What's Going Wrong?' prompts the reader to wonder about possible reasons. In these different ways, the headings of individual slides within a slide set help to mark both the flow of thought and the creator's approach to the content overall.

Focusing on successive slide headings can indicate cohesion. They can provide an insight into how the student has structured her whole presentation. A typical scenario for a Year 10 student undertaking the first research task (Plastic Bags) is to present the problem, general to particular, then some strategies to solve the problem, followed by a recommended solution.

Focusing on *knowledge representation*

Our use of "knowledge representation" comprises the substance and manner of presentation, in other words, the ways in which meaning is constructed and conveyed in relation to the task requirements and the audience. This perspective involves analysis of the interplay of the verbal and visual content in the meaning-making process. It considers the author's capacity to process/seek multiple sources/perspectives, select and assemble different elements to engage the viewer/reader and ultimately to produce a coherent text.

As far as knowledge representation is concerned, design requires us to consider the extent to which the author's choice of colours, template, graphics, images and even dynamic builds including sounds contribute to the overall impact of meaning-making. To be effective, the presentation of information needs to engage the viewer/reader more visually and dynamically than in the traditional essay text. The choice of font styles, colours, all contribute in their various ways to the overall effectiveness of the design.

With content, the quantity of text on screen, selection of images and the degree of their compatibility with the ideas presented can strengthen or weaken the knowledge being conveyed. Similarly, the selection of dynamic builds or placement of links can add or detract from the effectiveness of meaning-making. One of the biggest challenges in a multimodal context for evaluating content is identifying whether chunks of text have been simply copied from other sources. There is no easy solution to this perennial problem. In this study, at least with the recommended sites that the students were given in their preparation for these tasks, the researchers were able to easily assess what was original text and what was not.

In terms of considering cohesion through a set of slides, focusing on how the student has segmented or chunked the information to be conveyed is a good starting point. One of the most obvious techniques to achieve a balanced viewpoint is to use "pros" and "cons" with an introductory and concluding slide. This effectively enables the student to achieve a cohesive, balanced view of a topic. Many students in fact adopted this strategy.

By way of summary of the preceding discussion, Table 1 presents a matrix that aligns the three key criteria of design, content and cohesion across one axis, with the three dimensions of focus in the multimodal product, that is, the title slide, headings across the slide set, and knowledge representation across the set of slides on the other. The table provides more practical guidelines for the classroom teacher by using a series of questions for each cell of the matrix. These questions offer a tangible interpretation of the rationale that is intended to have practical value for the teacher.

Table 1: Questions developed for applying the design, content and cohesion criteria to analyses of multimodal texts

	Design	Content	Cohesion
Title slide	<ul style="list-style-type: none"> • Did the author use or manipulate an existing template? Or create her/ his own? • What effect is created by the size and/ or choice of image/ colour/ font style? • Were dynamic elements used effectively? 	<ul style="list-style-type: none"> • Is the title a phrase, statement or concept? • Is the title descriptive, informative, or subjective? • Does the title position the viewer to a particular stance on the topic? 	<ul style="list-style-type: none"> • Do choices in colour, template design, image and font style “match” the topic? • Do choices in colour, template design, image and font style complement/ blend/ conflict with each other?
Headings across the slide set	<ul style="list-style-type: none"> • Is the font style appropriate for the topic/ treatment? • Are colour choices appropriate/ aesthetically pleasing? • What relevance or effectiveness do any graphics or symbols in the heading/s have? 	<ul style="list-style-type: none"> • Is the choice of wording informational, conceptual, questioning or ...? • Do the headings help to construct multiple viewpoints on the topic? • How do the heading/s relate to the viewer? position the viewer to engage with a particular stance on the topic? 	<ul style="list-style-type: none"> • Are headings used throughout the slide set? • Are the headings disparate or do they help to construct a cohesive set within the parameters of the task?
Knowledge representation across the set of slides	<ul style="list-style-type: none"> • Does the choice of colour/ template/ graphic contribute to the making of meaning in the text? • Do images add impact to the construction of meaning? • Does the presentation of information engage the viewer/reader visually and/or dynamically? • Does the progressive revelation of information about the topic contribute to the viewer’s engagement with the information? 	<ul style="list-style-type: none"> • Does the content reveal depth/ breadth of knowledge? • Does the content reveal the author’s capacity to process/ seek multiple sources/ perspectives? • Is the content well-synthesised? • Is the content in the author’s own words or copied/ pasted from other sources? • Are sources acknowledged? • Is language use proficient? 	<ul style="list-style-type: none"> • Does the sum total of all nodal information contribute to a balanced treatment of the topic? • Does the overall structure of information respond to all key elements required by the task?

Note: Developed from Wyatt-Smith and Kimber (2005)

Reading student samples: Implementing the approach

Title slide: Year 8

This title slide (Figure 1) illustrates how Jenny experimented with the features available in *PowerPoint* to create her design. For example, the fonts have been manipulated and a photograph captured from the Internet has been combined with a clipart symbol, autoshape and *WordArt*. From the researchers' perspective, this combination of shapes and colours is somewhat mismatched, as evident in how the text extends beyond the autoshape. These different features illustrate a lack of cohesion and design skills, although she appears to have prioritised the design features in her product. From the student's perspective at Year 8, the slide could well be aesthetically pleasing and indicative of her capacity to identify and draw together different design features.



Figure 1: Jenny's title slide (Year 8, 2004)

Although not evident in the static image presented in Figure 1, the content of this slide was built up incrementally in five stages. That is, with each mouse click, a new word or shape was added to the slide. The initial full-screen image of the bird trapped in a plastic bag is immediately striking. With each successive mouse click, the emerging content contributes to the meaning-making. This dynamic building showed an awareness of audience and an acute sense of the impact of elements introduced incrementally to define the topic. For example, the revelation of the word "Eliminate", on its own, immediately engaged the audience so that even before the topic is introduced, their attention is captivated. This slide illustrates unambiguously the student's position on the topic.

The combination of images and words on the completed title slide lacks cohesion. The wide variety of strong colours conflict and detract from an aesthetic sense of cohesion. Also the way in which the various elements of text and image are arranged on the screen is awkward visually, although the progressive build somewhat disambiguates this confusion for the reader.

Title slide: Year 10

Jenny's title slide (2006, see Figure 2) illustrates a well-balanced, effective and cohesive combination of visual and verbal elements. The image choice is apt and has been enlarged to achieve full-screen impact, visually and powerfully conveying the meaning of global warming. The darkness at the top of the slide accentuates the white text title and the steam rising from the globe. The text is neutral and expository, in an appropriate contrasting colour and size, and is thoughtfully placed in the top right hand corner to produce an aesthetically pleasing slide overall.



Figure 2: Jenny's title slide (Year 10, 2006)

Headings: Year 8

In this section focusing on the headings of successive slides, the perspectives of design, content and cohesion are considered again, this time across the whole slide set. In this case, Jenny managed to complete five of six planned, successive slides/headings, as shown in Figure 3.

Table 2: Jenny's selection of design features in her headings, Year 8, 2004

Slide	Font style	Font size	Colours	Shadow
1	Arial	36	Yellow, pink borders	None
2	Broadway	36	Cerise, pink borders	Back slant
3	Juice ITC	36	Dark blue, pale blue borders	Right
4	Berlin sans FB	36	Green, black borders	Left
5	Showcard Gothic	36	Yellow, gold borders	Up

The main design feature of this set of headings is their visual appearance and impact. Table 2 presents details of Jenny's choices of font style, size, colours and shadow effects across the five headings. Although *WordArt* has been used for each heading and they are all the same size, each has a different font style and shadow effect. There is evidence of "play" in that each heading has a different shadow setting. Also some headings are centered and others are left justified.

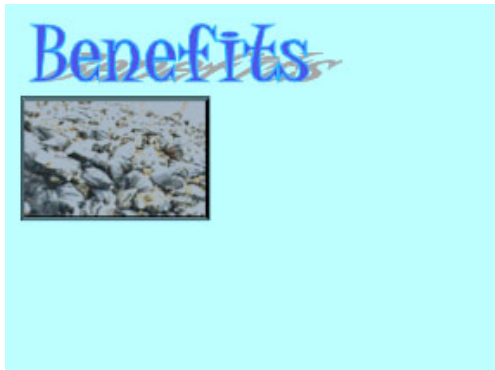
As far as content is concerned, these headings indicate an appropriate response to the position given in the title slide: anti-plastic bags. The headings are clear and succinct, building a logical flow of ideas in the headings, leading from the stated position through *benefits* and *alternatives* to a *resolution* (unfinished). While Jenny did not have time to finish all the slides she declared on the contents page, her sixth planned slide was "Resolution", which would specifically have addressed the question on the preceding slide, "Environmentally friendly?" The headings also reveal two conceptual framing of ideas (slides 3 and 4), one informational (slide 2), and two direct appeals to the viewer/reader as an imperative (slide 1) and a question (slide 5).



Title slide



Slide 2



Slide 3



Slide 4



Slide 5



Slide 6 (unfinished)

Figure 3: Jenny's Year 8 slide set (2004)

There seems to be little cohesion across the five title headings in the Year 8 product, except for the font size. The choice of strong colours is evident throughout, with different colours for each heading. In terms of content and design, however, these headings are still reasonably cohesive.

Headings: Year 10

The headings in Jenny's Year 10 product demonstrate text creation within a narrower range, both in terms of the colour variation and with regard to font styles and features. Interestingly, the font Berlin sans FB 36 used just for one heading title in Year 8 (slide 4) is now used on the title slide, with Magneto 36 used for the remaining three slides in the Year 10 production (see Figure 4). In this product, the colours are also limited to black and white, white chosen with a dark background and black on a white or light background. Table 3 presents a summary of features of her headings.



Figure 4: Jenny's Year 10 slide set (2006)

The approach Jenny takes to handling the content of the headings is to pose a series of questions that has the effect of drawing the audience with the all encompassing "we". These questions challenge the reader to reflect on their own views and opinions. Overall, this set of headings for the Year 10 product is much more cohesive in conventional terms than Jenny's Year 8 production.

Table 3: Jenny's selection of design features in her headings, Year 10, 2006

Slide	Font style	Font size	Colours	Shadow
1	Berlin sans FB	36	White, black borders	None
2	Magneto	36	Black, white borders	None
3	Magneto	36	White, white borders	None
4	Magneto	36	Black, black borders	None

Knowledge representation: Year 8

The strongest feature of Jenny's *design* choices is the opening full-screen image of the bird trapped in plastic. This image immediately declares the author's position and provokes a response from the viewer. She effectively manipulated text and image to communicate her position on plastic bags, adding impact to the construction of meaning. While there are five different coloured backgrounds in the slide set, the meaning-making of the 'Alternatives' slide is enhanced by the complementary green of the background colour with the conceptualisation of green alternatives to plastic bags. Overall, this presentation, while unfinished, indicates her effort to engage the viewer throughout, most obviously through the selection of confronting images. However, in terms of layout, Jenny's capacity to size the images and text to achieve a balance is still limited, for example, inconsistent sizing and positioning of images.

In this Year 8 sample, the quantity of *content* is limited, mainly consisting of headings, minimal text and a number of images. As a result, this student's concept map (Figure 5) and decision-making matrix (Figure 6) are also considered in this section on knowledge representation to shed light on the path she took to create the slide set.

Despite the minimal amount of text in the concept map (Figure 5), Jenny has completed all but one of the nodes in her own words and not copied verbatim from the Internet source. Each response is relevant to the question and shows a range of ideas. As well, both the advantages and disadvantages of different kinds of bags have been considered. Interestingly, in the top right hand node on the environmental problems associated with plastic bags, the text indicates possible images for later use in her presentation. Therefore, although the degree of completion is limited, there are clear indications of what might follow.

Similarly, the decision-making matrix (Figure 6) required the students to consider different strategies, separately, then to rate their relative value for the environment. Figure 6 indicates Jenny's clear preference for 'green bags'. Column two shows how she had weighed her options. Each strategy was supported with considered explanation in column three.

The content of the five slides (Figure 3), although limited, does show some evidence of logical sequencing and organisation, a contents list that indicates an organising structure and some sense of audience positioning. However, it cannot be said on the evidence presented here that the content reveals depth or breadth of knowledge. In fact, the concept map and decision-making matrix tend to support this view also. In the top left node of the concept map (Figure 5), however, the bullet points indicate a synthesis of information gleaned from two web sites. In this product, the visual images signify her opposition to the use of plastic bags.

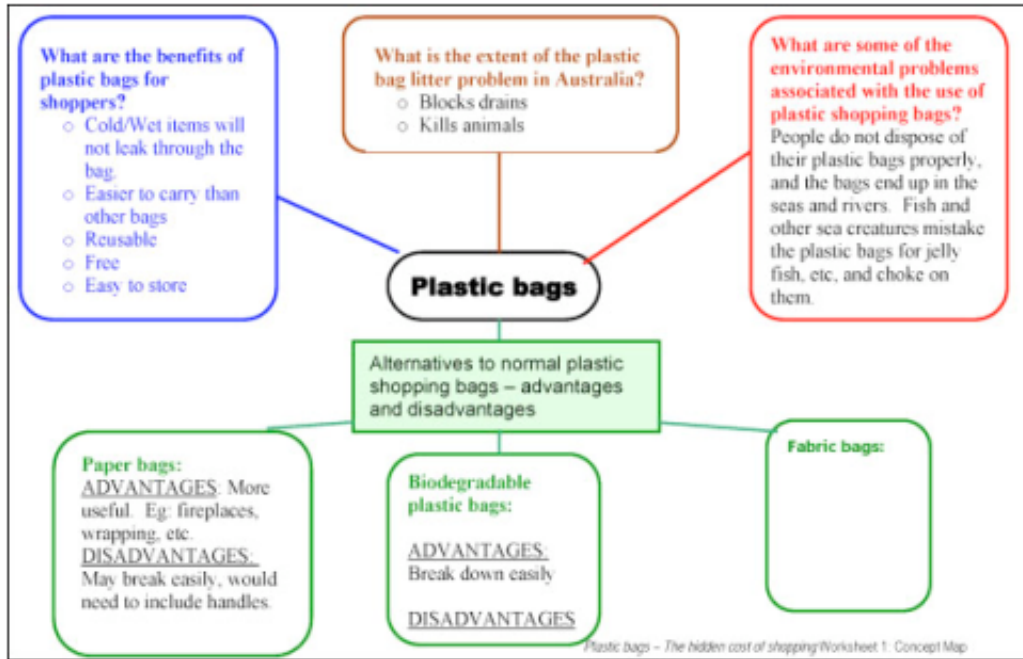


Figure 5: Jenny’s concept map (Year 8, 2004)

**Plastic Bags – The Hidden Cost of Shopping
Decision-Making Matrix**

Strategy for reducing plastic bag waste	Rating (5-1)	Why is this an effective strategy? Why does it get this rating?
<i>Example:</i> Community clean-up	★ ★ ★	<i>It could be highly successful but not everybody will want to be involved. Also, it is only a short-term solution as next year we would have to do it again.</i>
Using green bags instead (make them colourful for younger people)	★ ★ ★ ★ ★	It is an effective strategy because green bags are more attractive and secure than plastic bags, and if you put them on trial, for free, then everyone will get into the habit of using them. They can then be charged to buy the bags.
Go back to using paper bags	★ ★ ★	This is less pollution and people can reuse paper bags in all different sorts of ways. Eg: Fireplaces, wrapping, etc.
Biodegradeable bags	★	They do NOT last long enough, especially for reusing them.

Rating legend:

- ★ ★ ★ ★ ★: a highly effective strategy
- ★ ★ ★: a moderately effective strategy
- ★: a slightly effective strategy

Plastic bags – The hidden cost of shopping/Worksheet 2: Decision Making Matrix

Figure 6: Jenny’s decision-making matrix (Year 8, 2004)

Jenny reiterates her position a number of times through this presentation, in a variety of ways. For example, in Figure 7, the message is the same but the signifier is different: here in one case she uses imagery alone with the recognised icon of the red circle with its diagonal line to indicate prohibition; and then in another, she combines text and image to say the same thing. In another instance, she juxtaposes her question with a striking image that establishes a counterpoint “answer” (see Figure 3, slide 5). In all cases, Jenny shows considerable imagination, skill and flexibility in communicating her ideas. In this product, however, Jenny has not acknowledged any of the sources for her visual images as would be expected in scholarly work.

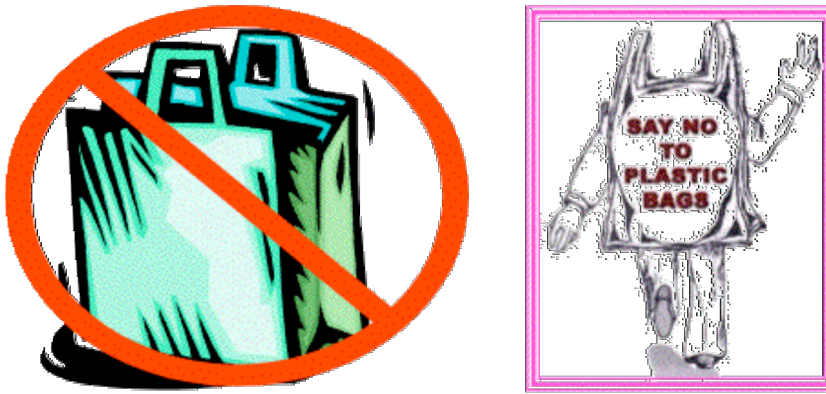


Figure 7: Jenny’s choice of visual signifiers of negative stance on topic (Year 8, 2004)

Although Jenny’s achievements here are limited, both in the final product and in the preparatory concept map and decision-making matrix, her active engagement with designing her response to the task is evident. There is strong cohesion between her image selection and her stance on the topic, and she is particularly imaginative in conveying this view. It is not clear how far she would have been able to refine and supplement these ideas with more time for completion of the six slides she had planned. The Contents page in particular, with its six sequential elements, is clear evidence of forward planning with overall cohesion in mind.

Knowledge representation: Year 10

On the surface, the *design* of the Year 10 product (see Figure 4) is convincing and there are undoubtedly some strong design components. The images are engaging, relevant and well-chosen; they are employed in this presentation almost entirely as full-screen background images for the text. The layout of the title screen, as discussed earlier, is well-designed. The colour thematic established on the title page is largely carried through the remaining slides, giving the whole set a sense of continuity and cohesion. There are no dynamic elements, as in the Year 8 product. At a deeper level, however, the images do not always support the textual content. In slides 2 and 4, the text is difficult to read because of the lack of contrast between text and image; different colour combinations were needed. In practical terms, Jenny needed a stronger hold on managing the design elements.

After the title slide, the *content* is organised around three questions which Jenny answers with general observations or random, disconnected statements (see Figure 4).

These are presented in bullet points without any regularity in the form of the phrases or sentences. On the third slide she clearly indicates that global warming is not proven at present, a perspective derived from one of the source websites, "Green myths on global warming – debunked". This website, authored by the Association of British Drivers, has a full and detailed coverage, structured point by point with ten one-line "myths", for example, "Planet earth is currently undergoing global warming". In her summary she criticises the website for insufficient information; however, there was sufficient information with which to build a stronger case than she was able to frame. In evaluating the website, her conclusions were contradictory, although in the *PowerPoint* slide that follows from it, only one side of the argument, the side projected on the website, is given. In the last slide, "Are we contributing?", her first bullet point simply replies to the question and says, "Yes, we are". The other bullet points again indicate some confusion in her conclusions which seem to say that our contribution now is small, but it will be significant in the future.

Whilst there are only four slides in the set, the use of questions in the headings, the alternating colour schemes and the choice of images all work together to create *cohesion*. For example, the question mark image on slide two, underscores the question in the heading, and its colour schemes match the blues, greys and silver in the final slide. Similarly, the colour of the font alternates between white and black from slide to slide, but the style remains constant. Unfortunately, insufficient attention is paid to readability, especially when black text is placed over a very dark section of the image.

Discussion

To this point we have analysed the title slides, the headings and the knowledge representation in the two data sets from the perspectives of design, content and cohesion. In this section, we draw together the various strands of the discussion and comment on the major differences between this individual student's Year 8 and Year 10 products. As previously, we will structure the discussion around a commentary on design, content and cohesion as they apply to the title slides, the headings and the knowledge representation.

The title slides (Figures 1 and 2) illustrate intriguing differences in terms of design and how Jenny has utilised the affordances of the software to give impact to her meaning-making. Firstly, the dynamic build of the title slide in Year 8 is noteworthy in that the student utilised features of the software, text and image to create a single slide design. The viewer or reader governs when the next element is added to the visual display, with each click of the mouse revealing a new element of the title slide. The use of a dynamic build rather than the immediate presentation of a finished slide allows the designer to introduce ideas to the reader incrementally, and thereby induce various reactions stage by stage within the context of a single slide.

One might argue therefore that the student in Year 8, at least as far as the title slide is concerned, is using the affordances of the *PowerPoint* presentation tool more extensively and creatively than she did in Year 10. On the other hand, perhaps the decision to present a single slide element by element is less to do with considered use of the tool to communicate an idea effectively and more to do with simple experimentation with an attractive option. Furthermore, the introduction of the title slide in stages is less frequent with older students and with adults. Over time, and after being exposed to repeated presentations within the school environment, the

student may be responding to school cultural expectations regarding a particular way of conceptualising a *PowerPoint* presentation. This observation may not only apply to title slides, but in the whole way the *PowerPoint* is conceived and presented. Thus, it is not simply a question of expertise in the development tool itself, but questions of appropriacy in relation to the institutional school context, especially at the higher level, where perhaps conventions and expectations of visual design and presentation for multimodal products become more normalised and fixed, even if only implicitly conveyed and understood.

For the same student, it is undoubtedly the case that the title slide in Year 10 is well designed (Figure 2). It presents a powerful title slide wherein the combination of text and image is more controlled and restrained than in Year 8 (Figure 1). In Year 10, Jenny has become more aware of the expectations involved in creating a *PowerPoint* presentation within a school environment, especially in the visual aspects. There appears to be less spontaneity and more of a sense of what is to be expected in this kind of multimedia text. The garish, mismatched colours in the earlier title slide (Figure 3) contrast markedly with the colours chosen in the latter (Figure 4), being understated and symbolic. In fact, a key difference is the directness of the text and image in conveying the author's position on the topic. In Year 8, Jenny's position on the topic was made very clear on the title slide; in Year 10, her position was more restrained, and the viewer/reader has to wait for later slides to ascertain the author's position on the topic.

Jenny's Year 8 product indicates experimentation with the *PowerPoint* tools and options within a particular context. As with the dynamic build of the title slide, Jenny is inventive and playful as she explores the software design options on offer. That is, in the Year 8 product, headings are characterised by five different fonts, five different colours, and five different shadow effects. As noted earlier, Jenny is clearly experimenting with the shadow settings. In stark contrast, the headings across the slides at Year 10 are much more restrained. The evidence of experimentation is missing, although at the same time there is much more of a sense of appropriacy, as in locating the heading with regard to the image and in choosing an appropriate font size, style and colour. From Year 8 to Year 10, Jenny moved from using a wide variation of strong colours to black and white, and towards a simplicity in style, particularly with the removal of additional font attributes such as shadows in the Year 10 product. Whereas the *WordArt* was varied in the earlier product, it was consistent in the latter one. There is a sense here perhaps of advancement on the one hand and of loss on the other. While the Year 10 product shows a strong sense of unity and cohesion appropriately within a set of conventions and expectations, there is perhaps a loss of experimentation and vitality compared with the Year 8 product.

In Jenny's Year 8 and Year 10 products, one can detect similarities and differences in design choices across the years, especially in terms of colour and images. At Year 8, the choice of colours to the mature eye is rather shrill with many strong colours varying from slide to slide. In both cases there is a fairly logical progression of ideas from one slide to the next and generally there is one image to a slide. The images are powerful and ideologically value laden in both presentations. However, one can detect more subtlety in the ideological positioning at Year 10: at Year 8, it is more direct, passionate and emphatic, especially in the title and content slides. In the Year 10 product the author's position is more restrained and circumspect as shown by the headings formulated as questions at the top of each slide, although the final slide where the full-

screen image in a sense answers the question posed in the heading still leaves the viewer in no doubt about the author's position.

The heading posed as a question, juxtaposed with an image as a contradictory "answer", is a recurring technique used by Jenny to create meaning in a visually powerful way. It was used in slides 3 and 5 in the Year 8 product and again in slide 4 in the Year 10 presentation. It is difficult to ascertain how common this practice is for students' multimodal products across each year, but it is interesting to see this technique re-occurring for Jenny.

As far as content is concerned, the similarities between the two products are instructive. In the Year 8 product, when the content of the concept map and decision-making matrix was reviewed, we found that Jenny was able to transfer content from one source to another reasonably well. She completed all but one node of the concept map in her own words, and was able to give a strategy together with an explanation in the decision-making matrix. We concluded that the content, although limited in terms of breadth and depth, showed some evidence of sequencing and organisation.

Two years later, when no structural templates were provided to aid content development, Jenny still appeared able to transfer text from one location to another, but was unable to go the next step, that is, to evaluate information, formulate her own opinion, and then communicate it. At Year 10, Jenny was still having difficulty formulating her own views and drawing conclusions from the material she had read on the resource website. The later slides contained a mix of statements, some taken directly from the source website (slide 3), and some perhaps representing her own opinion, but not finally resolved or clearly formulated (slide 4). In everyday terms, Jenny was not in command of the material she had read. She had not processed it sufficiently to reach a point where she could form an opinion and then communicate it clearly.

In our case study with Jenny, we are able to show that some improvements were made with regard to design and cohesion, although the area of knowledge representation was still a challenge for her. We would like to know more. However, in this study we are not in a position to conclude whether the differences between the Year 8 and Year 10 products are more to do with a higher degree of knowledge and experience with the tools, or a higher degree of acculturation to the conventions and expectations of a *PowerPoint* presentation created within a high school context. Other factors may well include maturation/age development, motivation, familiarity with the software and the task itself. Nonetheless, our approach has illustrated ways in which a teacher might focus upon a manageable number of features within a multimodal text that are indicative of the student's capabilities across salient areas of performance.

Conclusion

This article has presented an approach to the selective analysis of multimodal products. The focus on design, content and cohesion applied to the title slides, headings and knowledge representation enabled a comparison between Years 8 and 10. Jenny's Year 8 product was vibrant, inventive and colourful, with some intriguing and creative juxtapositions between text and image that most certainly motivated and engaged the viewer. In contrast, her Year 10 product was more controlled, more sophisticated in its colour scheme and blend of text and image, and certainly more

aligned to what one might consider a *PowerPoint* presentation created by a “mature” student. While it is not possible to draw conclusions about what we might term “Year-8-ness” and “Year-10-ness” on the basis of one case study, we have found that close attention to the single student over the two years has informed our understanding of student capabilities at different year levels.

What we have learned from this project is an acute awareness of the complexity of multimodal text production. Such work requires students to have sufficient time to complete the tasks, and we found repeatedly in this study that students did not finish in the allotted time. We also found that the scaffolding procedures for Jenny at Year 8 through the concept map and decision-making matrix were very helpful in guiding her towards a more complete, task relevant outcome. The study also raised the critical importance of students needing to develop their reflective and evaluative processes in relation to the task. We have suggested that the design, content and cohesion criteria offer potential for evaluative and comparative purposes. Focusing on each of these criteria in turn, separately as well as collectively, can assist teachers to create the types of tasks to facilitate the required production capabilities, as illustrated in a practical way in Table 1. As well, students could use this matrix as a checklist for directing attention towards improving specific aspects of the multimodal product.

Finally, the approach adopted here has offered a way into understanding not just the salient features of multimodal texts, but also the need for students’ greater fluency within and across those features to improve the overall quality of their production. From these perspectives, teachers can intervene to exercise more positive influence on improving the process of production including priority choices and allocation of time and resources.

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